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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,084	06/20/2001	Kensaku Komatsu	209991US0	2344

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EXAMINER
FORTUNA, ANA M

ART UNIT	PAPER NUMBER
1723	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

MFC

Office Action Summary	Application No. 09/884,084	Applicant(s) Komatsu et al
	Examiner Ana Fortuna	Art Unit 1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on Mar 6, 2002 .

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-28 is/are pending in the application.

4a) Of the above, claim(s) 6-28 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-5 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☒ All b) ☐ Some* c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3-4

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-5, drawn to a hollow fiber membrane, classified in class 210, subclass 500.23.

II. Claims 6-9, drawn to a process of making a hollow fiber, classified in class 264, subclass 41.

III. Claim 10, drawn to a hollow fiber module, classified in class 210, subclass 321.8.

IV. Claims 11-28, drawn to methods of using a hollow fiber in separation, classified in class 210, subclass 650.

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the membrane is not limited to the process of making, and can be made by adding a nonsolvent for forming the pores instead of the microparticles as claimed in the group of claims of group II. .

3. Inventions I and IV are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product

as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the membrane can be used in a distinct processes, e.g. separating oil from water..

4. Inventions I and III are related as a product or membrane and an apparatus or module containing the membrane. The membrane is not limited to the structure of the module of claim 10, which is limited to accommodating a bonding resin block inside the housing containing the membrane. In this case the membrane can be use in a different module, e.g. immerse membrane modules.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Frederick D. Vastine on 4/16/02 a provisional election was made with traverse to prosecute the invention of I, claims 1-5. Affirmation of this election must be made by applicant in replying to this Office action. Claims 6-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

In the instant case the membrane of group I is not limited to the apparatus structure claimed having resin in the housing, and can therefore be use in any other module, e.g. immerse membrane modules.

DETAILED ACTION

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamo et al (5,746,916)(hereafter Kamo). Kamo discloses a microporous membrane having a high flux, and having pores within the microporous range (column 7, lines 52-58). The membrane has a high porosity and can be formed as a hollow fiber in shape (column 8, lines 55-61), and has pores which cause retention of particles having the molecular weight cutoff (in micrometers) claimed in

the present invention, e.g. 1-10, based on the microporous size (column 22, table 1, column 6). Water filtration rate of the order of 10 exp. 3 is discloses in the same table. The membrane is made by using particles in the membrane solution to produce the pore and further stretching to produce slit-like pores, the particles have a pore size between 1 to 10 micrometers, and are considered responsible for the pore formation of the membrane (column 9, lines 32-41, and column 10, lines 34-47). The membrane water filtration rate was determined in the examples for membranes made with particles having 8 or lower particle size diameter (Table 1). Kamo does not disclose the water flow rate as claimed, however teaches making the membrane from particles having larger particle diameters, e.g. 10 microns. It would have been obvious to one skilled in the art at the time the invention was made to achieve membranes with larger pore size, and therefore higher permeability, e.g. by selecting larger article size, and or controlling stretching degree, as suggested by Kamo. As to claim 3, polysulfone is disclosed by Kamo (column 3, line 38).

10. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawada et al (5,340,480 (hereafter Kawada). Kawada discloses a microporous membrane having high water permeability, the membrane is a hollow fiber made form mixtures of polysulfone and hydrophilic polymer added to the membrane solution at a concentration within the claimed percentages of claim 4, e.g. 1-8 % (abstract, column 10, lines 41-53, column 13, lines 10-36, column 14, lines 51-64). The molecular weight cutoff is disclosed, based on the membrane pore size, which is microporous. Kawada fails to disclose the water flow claimed in the present invention. Increasing the membrane water permeability by increasing the amount of pore former or nonsolvent in the

membrane composition, e.g (PEG). It would have been obvious to one skilled in the art at the time the invention was made to adjust the membrane composition in order to rich to a higher microporous in the membrane, and further expect a high water flux for membrane with micropores of 5 microns or larger. Although PVP and copolymers of PVP and vinyl alcohol polymers as disclosed as the hydrophilic polymers, both polymers alone, e.g. PVP and polymers of VA are expected to have the same effect in membrane modification, as it is suggested by Kawada (column 15, lines 25-27). PVP and PVA are equivalent well known in the art for membrane modification of hydrophilization.

11. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al(6,045,694)('694). Reference '694 discloses a polysulfone hydrophilic membrane containing between 0.5 to 10 % of hydrophilic polymer or polymeric wetting agent, the membrane has pores between 0.01 to 10 microns, which reject particles with molecular weight within the claimed range of claim 1 (abstract, column 3, lines 24-68, column 4, lines 37-51, column 6, lines 31-49). The membrane water flux claimed is not disclosed in '694, however, it seems to be inherent of a hydrophilic membrane having pore size of 10 micrometers, as disclosed in '694. It would have been obvious to one skilled in the art at the time the invention was made to adjust membrane composition, to reach to a membrane having the pore size disclosed in '694, furthermore, providing hydrophilic properties and ion exchange properties to improve the membrane is disclosed.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana Fortuna whose telephone number is (703) 308-3857. The examiner can normally be reached on Monday-Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached on (703) 308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 for regular responses, and (703)872-9311 for after finals.

ANA FORTUNA
PRIMARY EXAMINER

Ana Fortuna

April 10, 2002